

CLAIMS

1. A liquid ejection head, comprising:
 - an ejection port for ejecting a liquid;
 - 5 a flow passage communicating with said ejection port;
 - a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and
- 10 a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so
- 15 as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by
- 20 formation of said bubble,
- wherein said movable member is constructed by lamination of three or more layers, an edge surface of at least one layer of said movable member being covered, at said free end, by another layer of
- 25 said three or more layers.

2. The liquid ejection head as claimed in claim 1, wherein said edge surface of said movable member at said free end forms a flat surface.

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3. The liquid ejection head as claimed in claim 1, wherein said movable member has an initial bending in a direction opposite to said heating body.

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4. A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said ejection port;

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a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

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a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said

ejection port as a result of a pressure caused by formation of said bubble,

said movable member comprising lamination of at least three layers of two, different materials,
5 an edge surface of at least one layer of said movable member being covered, at said free end, by a layer forming an outermost layer of said movable member.

10 5. The liquid ejection head as claimed in claim 4, wherein said edge surface of said movable member at said free end forms a flat surface.

15 6. The liquid ejection head as claimed in claim 4, wherein said movable member has an initial bending in a direction opposite to said heating body.

7. A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said
20 ejection port;
a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and
a movable member provided on said device
25 substrate in a state such that a first end thereof is

fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is
5 formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,
10 said movable member comprising lamination of two or more layers of two, different materials, said lamination including a first layer closest to said device substrate, an edge surface of said movable member being covered, at said free end, a
15 layer of an odd number order as counted from said first layer.

8. The liquid ejection head as claimed in claim 7, wherein said edge surface of said movable member at said free end forms a flat surface.
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9. The liquid ejection head as claimed in claim 7, wherein said movable member has an initial bending in a direction opposite to said heating body.

10. A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said
ejection port;

5 a device substrate provided with a heating
body for forming a bubble in said liquid filled in
said flow passage; and

a movable member provided on said device
substrate in a state such that a first end thereof is
10 fixed upon said device substrate and a free end at an
opposite end of said movable member is in a freely
movable state, said movable member being provided so
as to face said heating body such that there is
formed a gap between said movable member and said
15 device substrate, said movable member causing a
displacement upon ejection of said liquid from said
ejection port as a result of a pressure caused by
formation of said bubble,

said movable member comprising lamination
20 of three or more layers of three, different materials,
an edge surface of said movable member being covered,
at said free end, said lamination including a first
layer closest to said device substrate, an edge
surface of said movable member being covered by an
25 uppermost layer forming aid lamination and formed of

a material identical with a material constituting said first layer.

11. The liquid ejection head as claimed in
5 any of claim 10, wherein said edge surface of said
movable member at said free end forms a flat surface.

12. The liquid ejection head as claimed in
claim 10, wherein said movable member has an initial
10 bending in a direction opposite to said heating body.

13. A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said
15 ejection port;
a device substrate provided with a heating
body for forming a bubble in said liquid filled in
said flow passage; and
a movable member provided on said device
20 substrate in a state such that a first end thereof is
fixed upon said device substrate and a free end at an
opposite end of said movable member is in a freely
movable state, said movable member being provided so
as to face said heating body such that there is
25 formed a gap between said movable member and said

device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

5 said movable member comprising lamination of two or more layers of tow or more materials, said movable member having a flat edge surface at said free end.

10 14. The liquid ejection head as claimed in claim 13, wherein said movable member has an initial bending in a direction opposite to said heating body.

15 15. A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said ejection port;

20 a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

25 a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so

as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said 5 ejection port as a result of a pressure caused by formation of said bubble,

said movable member having an initial bending in a direction opposite to said heating body.

10 16. The liquid ejection head as claimed in claim 15, wherein said movable member engages with a stopper part provided at a side opposite to said heating body in an initial state of said movable member.

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17. The liquid ejection head as claimed in claim 15, wherein said movable member carries a tensile film at a side thereof opposite to a side of said heating body.

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18. A liquid cartridge comprising a liquid ejection head and a liquid container containing a liquid to be supplied to said liquid ejection head, said liquid container forming a unitary body with 25 said liquid ejection head, said liquid ejection head,

comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said
ejection port;

5 a device substrate provided with a heating
body for forming a bubble in said liquid filled in
said flow passage; and

a movable member provided on said device
substrate in a state such that a first end thereof is
10 fixed upon said device substrate and a free end at an
opposite end of said movable member is in a freely
movable state, said movable member being provided so
as to face said heating body such that there is
formed a gap between said movable member and said
15 device substrate, said movable member causing a
displacement upon ejection of said liquid from said
ejection port as a result of a pressure caused by
formation of said bubble,

wherein said movable member is constructed
20 by lamination of three or more layers, an edge
surface of at least one layer of said movable member
being covered, at said free end, by another layer of
said three or more layers.

25 19. The liquid ejection apparatus for

ejecting a liquid from a liquid ejection head, said liquid ejection apparatus comprising a liquid ejection head comprising:

an ejection port for ejecting a liquid;

5 a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

10 a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so
15 as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by
20 formation of said bubble,

wherein said movable member is constructed by lamination of three or more layers, an edge surface of at least one layer of said movable member being covered, at said free end, by another layer of
25 said three or more layers.

20. An image forming apparatus for forming
an image on a recording medium by ejecting a liquid
from a liquid ejection head, said image forming
5 apparatus comprising any of a liquid ejection head
comprising:

an ejection port for ejecting a liquid;
a flow passage communicating with said
ejection port;

10 a device substrate provided with a heating
body for forming a bubble in said liquid filled in
said flow passage; and

a movable member provided on said device
substrate in a state such that a first end thereof is
15 fixed upon said device substrate and a free end at an
opposite end of said movable member is in a freely
movable state, said movable member being provided so
as to face said heating body such that there is
formed a gap between said movable member and said
20 device substrate, said movable member causing a
displacement upon ejection of said liquid from said
ejection port as a result of a pressure caused by
formation of said bubble,

wherein said movable member is constructed
25 by lamination of three or more layers, an edge

surface of at least one layer of said movable member being covered, at said free end, by another layer of said three or more layers.

5 21. A method of manufacturing a liquid ejection head, said liquid ejection head comprising: an ejection port for ejecting a liquid; a flow passage communicating with said ejection port; a device substrate provided with a heating body for
10 forming a bubble in said liquid filled in said flow passage; and a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely
15 movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said
20 ejection port as a result of a pressure caused by formation of said bubble, wherein said movable member is constructed by lamination of three or more layers, an edge surface of at least one layer of said movable member being covered, at said free end, by another
25 layer of said three or more layers,

said method comprising the steps of forming
 a part in which two or more layers of a same material
 are directly laminated; and
 etching said part.